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31

**WHAT IS CLAIMED IS:**

1. (currently amended) An apparatus for illuminating a test material in a light profile microscope, comprising:

a source of radiation providing a source beam propagating along a beam axis  $[[x']]$   $\underline{x}$ ;

an anamorphic optical means providing, from the source beam emitted by said source of radiation, a source beam elliptically collimated over an  $[[x']]$   $\underline{x}$  axial collimation region having a distance comprised in a range between micrometers and meters, and having a major elliptic axis oriented along a first transverse axis  $[[y']]$   $\underline{y}$ , and a minor elliptic oriented along a second transverse axis  $[[z']]$   $\underline{z}$ ;

a test material positioned to intersect the elliptically collimated source beam within the  $[[x']]$   $\underline{x}$  axial collimation region to form an irradiated volume, said test material comprising an image transfer (IF) surface oriented substantially parallel to the  $[[x']]$   $\underline{x}$  axis and substantially orthogonal to the  $\underline{z}$   $[[z']]$  axis, said IF image transfer surface transmitting radiation emitted from said irradiated volume in said test material;

an optical imaging system (OIS) forming an image, at an image plane, of the illuminated volume in the test material from the radiation transmitted by the IF image transfer surface; said OIS optical imaging system defining an object plane conjugate to the image plane and aligned to contain the major elliptic axis of the collimated source beam intersecting said test material in the illuminated volume, an object depth of focus of said

OIS optical imaging system being maintained at a value of approximately at least 1/5 of a radius of the elliptically collimated source beam along the  $[[z']]$   $z$  axis in the axial